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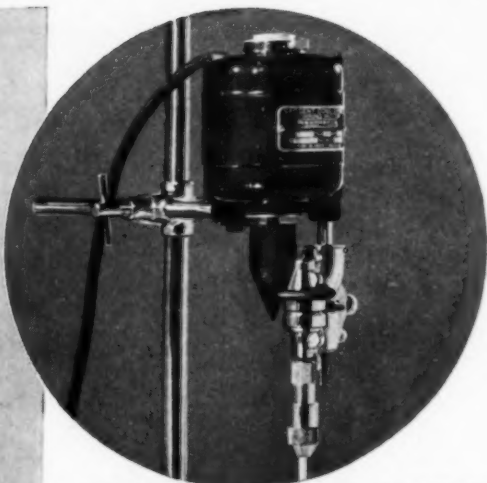
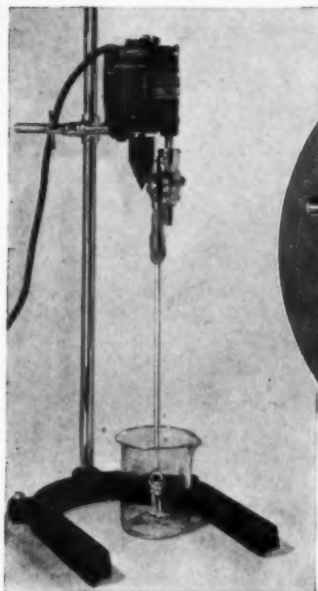
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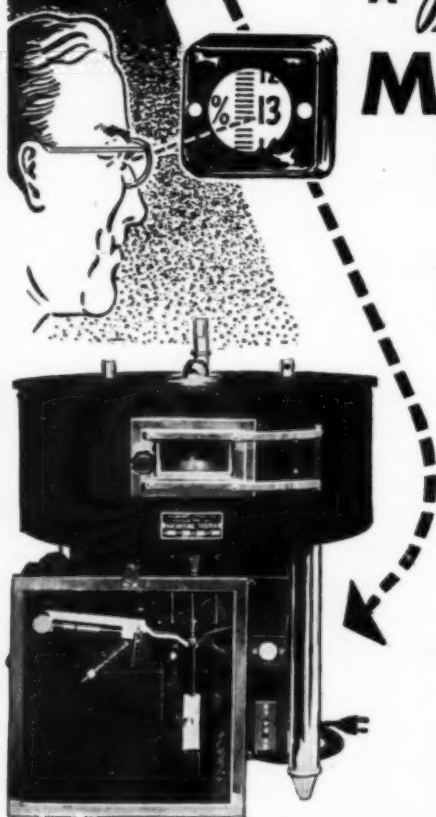


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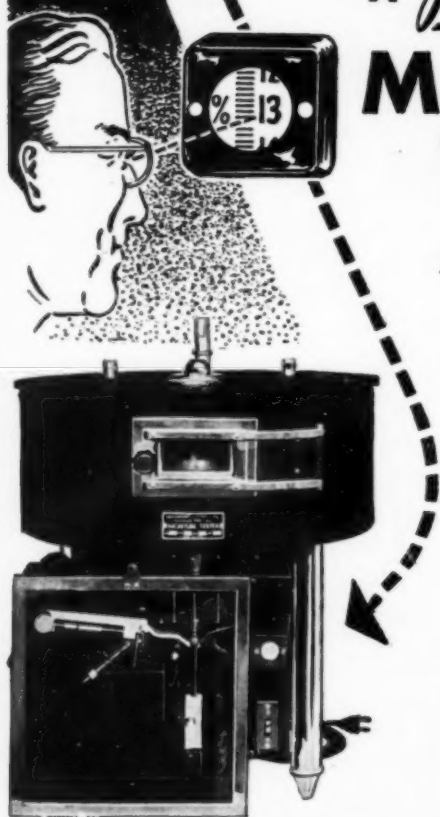
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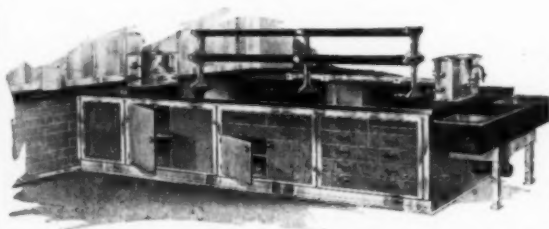
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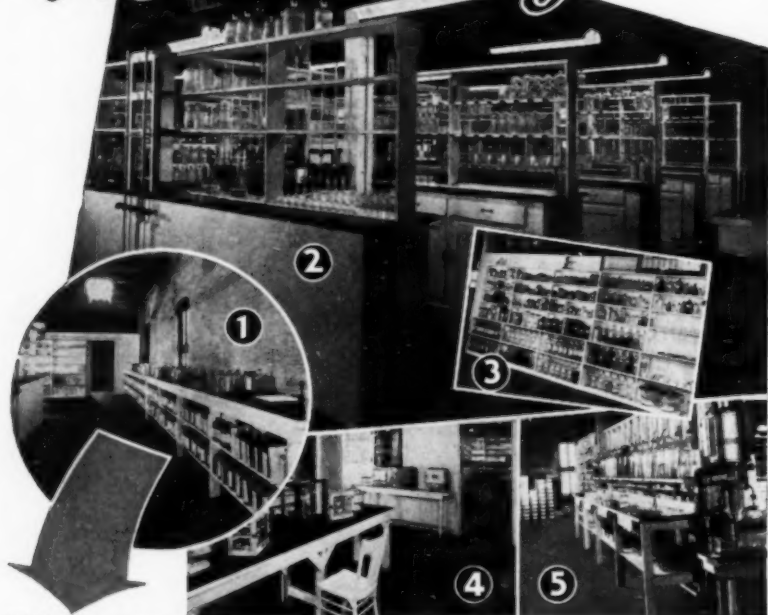
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Natural Rubber Production in the Americas

Dr. Earl N. Bressman

Director, Inter-American Institute of Agricultural Sciences

SIMULTANEOUSLY today move two great rubber developments of far-reaching importance to the economic future of the Americas. These are the creation in the United States of a synthetic rubber industry and, in the tropical Americas, development of natural rubber production. Rubber is indissolubly bound up with the economic destinies of the hemisphere. What rubber means to our motor and machine age has been well illustrated in the repercussions from the loss of rubber supplies in the far East.

Right now the important thing is to get rubber. We must get it from any and every source available, natural and synthetic, as quickly as possible. That is all that matters immediately.

As director of the newly-established Inter-American Institute of Agricultural Sciences, at Turrialba, Costa Rica, I am identified with the scientific effort to grow natural rubber in the Western Hemisphere, to produce it economically so that American rubber growers may hold their own in the long-range test for survival, so

that they may meet competition from any quarter.

I have faith in the ability of American rubber growers to hold their own, once they get well started with improved strains of rubber trees. I believe the costs of growing natural rubber in the Western Hemisphere can be reduced beyond anything which has been demonstrated heretofore. And, in that firm belief, I am hoping that natural rubber will have full opportunity to prove its capacity to survive, whether the competition comes from the ingenious chemist or producers able to draw upon large reservoirs of low-paid labor outside the Western Hemisphere.

I shall not attempt to narrate, or to analyze, all the developments going on now in rubber. Much of the rubber program for immediate war needs is concentrated on efforts to increase quickly production of wild rubber in the Amazon basin and in Central America. The program also includes projects for production of rubber from quick-growing plants, such as *cryptostegia* and *guayule*. I am



concerned here mainly with the story of what is being done to put natural rubber production on a sound basis for the long run, with the possibilities for developing small unit plantations, with the question whether natural or synthetic rubber will become our chief source of raw material.

There can be little doubt, I am sure, that the lessons of this war will count heavily in our long-range policies on rubber. We have learned by bitter experience the dangers of dependence upon distant sources of rubber when we can produce rubber at home or near to home. I am assuming that in the post-war period we shall want to rely—certainly more than before the war—upon nearby sources of rubber. That will mean natural rubber from the tropical Americas or synthetic rubber from plants in the United States. Perhaps these in combination will be the answer.

For one thing, it must be recognized that rubber consumption in the other Americas is growing. If this trend continues, as appears likely, the other Americas will use more and more of their own natural rubber production. It also must be recognized that potentially the tropical Americas could increase rubber production greatly and provide a large exportable surplus. How far they go in developing an exportable surplus will depend upon the ability of American-grown rubber to stand up in competition in the market-place, whether it is com-

petition for the United States market or for markets outside the hemisphere.

Another point to be stressed is this: World rubber consumption in the past few decades has increased rapidly. The curves of consumption, both in the United States and outside the United States, seem likely to continue to rise for a long time. I believe United States consumption of rubber will expand until it doubles, at least, consumption during the peak year of 1941. In that year the United States used around 775,000 tons. If I am correct in this assumption, the long-term uptrend in rubber consumption will mean the United States eventually will require 1,500,000 tons of rubber annually. That means a billion-dollar industry. What a prize for the chemist and agricultural scientist! Surely this is a prize rivalling the gleam of wealth which drew gold seekers to the Americas hundreds of years ago. Here is an El Dorado worthy of the magic of modern science. It is a story of fortune hunting evolving out of the urgent needs of wartime, in the obscurity of patient research behind the drama of the fighting fronts. Yet, in the long run, this may be one of the most important stories of our time.

Millions of young rubber trees grow in the sun of the tropical Americas. These are the vanguards of the new plantation industry, the plantation industry which I believe will be

NATURAL RUBBER PRODUCTION IN THE AMERICAS

able in the long run to stand the test for survival.

In this new plantation industry, inter-American cooperation plays a big role. The Inter-American Institute of Agricultural Sciences, sponsored by the Pan-American Union, with initial funds provided by the Office of Inter-American Affairs, is but one symbol of progress in the inter-American cooperation which is making possible the hemisphere rubber-development program. Fifteen of the Latin American countries, together with the United States, are active participants in the inter-American effort to bring rubber back home and to place it upon a solid economic foundation.

The United States Department of Agriculture, in collaboration with the tropical Americas, is carrying on research for the improvement of plant materials and for commercial stimulation of existing strains resistant to leaf blight as well as high-yielding strains. In the one-hundred cooperative nurseries established in the other Americas, nearly 20,000,000 budded trees already have been produced. These are material for the plantation industry. Five experiment stations strategically located are making available scientific research and guidance for development of plantations, small and large. The Institute of Agricultural Sciences is preparing to take an active hand in this program, in collaboration with experiment stations of the other Americas.

Thus we see taking shape the dreams of those who years ago saw the need for growing rubber supplies closer to home. Former President Hoover, in 1926, when he was Secretary of Commerce, initiated studies of rubber-growing in the hemisphere. President Roosevelt, Vice President Wallace (while Secretary of Agriculture) and former Under Secretary of State Welles aided in a drive to get Congressional action which finally, in 1940, resulted in appropriation of \$500,000 to enable the Secretary of Agriculture to conduct investigations for development of Western Hemisphere rubber production.

Dr. E. W. Brandes, in charge of the Special Rubber Project of the United States Department of Agriculture, had done a remarkably speedy and thorough job in field studies for this development. Now the essential plant material, consisting of *Hevea* rubber trees of high yields and disease-resistant strains from the Orient, developed in the tropical Americas, is available for further expansion of natural rubber industry in the Americas.

The most important of the cooperative field stations is located at Turrialba, near San Jose, the capital of Costa Rica. This station, started in 1940, is fully equipped and stocked. It possesses ample land for nurseries, clone collections and other limited plantings. Turrialba was selected as the site because it is ideal for investigation of the most serious pest of the

rubber tree in this hemisphere, the South American leaf blight. The volcanic soil is excellent for growing rubber. Moreover, it is well situated to collaborate with the Inter-American Institute of Agricultural Sciences in future research and development work.

The government of Costa Rica has provided a thousand-hectare experiment station, known as "Los Diamantes," near Guapiles, about fifty miles from Turrialba. This farm is less than 1,000 feet above sea level and is representative of the broad northern coastal plain, which is well adapted for rubber growing. It will serve primarily as a propagation garden to supply bud wood to growers in regions infected by the leaf blight.

Another important cooperative field laboratory is at Belem, Brazil, gateway to the Amazon rubber country. This laboratory is located at the Instituto Agronomico do Norte, operated by the Brazilian Department of Agriculture. Considering its strategic position, the Belem center may have a key role in the development of rubber production in the Amazon basin. Studies will be carried on there in different kinds of *Hevea* rubber indigenous to the Amazon country. Scientists will collect bud wood and seeds of superior trees. Up-river stations will be established to carry on agronomic research. Improvement in tapping methods and preparation of rubber from wild trees immediately are

receiving special attention in view of the need of rubber for war purposes.

In Haiti, a cooperative field station has been established at Marfranc for propagation of planting material. This material will be available for distribution locally and to nearby countries. The leaf blight has not been found in Haiti. Strains of *Hevea* rubber susceptible to leaf blight will be crossed with resistant selections from the jungles of South America at the Marfranc station.

The cooperative field station at Tela, Honduras, is located at the famous Lancetilla Farm, research station of the United Fruit Company. Two plantations of mature seedling rubber trees planted in 1926 by the United Fruit Company are sources of seed for root stock production. In addition, the latest of those mature trees is used in developing techniques for small-scale or family-size rubber enterprises.

In Mexico, cooperative projects are under way with the Ministry of Agriculture at the El Palmar experiment station near the city of Tezenapa, state of Vera Cruz. Some 300 acres of mature rubber trees near this station provide ample seeds for production of root stocks and are under investigation for superior clones. Some of the latter, following blight-resistance tests at Turrialba, may prove valuable for commercial planting.

In former times, when there was no competition to force rubber grow-

NATURAL RUBBER PRODUCTION IN THE AMERICAS

ers to develop special products for specific uses, the latex yield from all types of clones and rubber trees went to make up a conglomerate mass. This yielded a general or all-purpose product which had to serve wherever rubber was required. This all-purpose product, of course, had many shortcomings. In the last three or four years before Java and Sumatra fell to the Japs, the Dutch were beginning to make great strides in developing natural rubber for specific purposes. They had found that latex from different rubber trees, and particularly different strains, varies greatly in its properties and that it is of value to keep the latex produced from different strains of trees separate for use where best adapted.

As regards price, of course, between natural and synthetic rubber, the—natural rubber is much the cheaper. Even if the raw material were to cost nothing, it seems illogical to expect that synthetic rubber could be polymerized out of either alcohol or petroleum in a city factory, paying high taxes and wages, overhead, etc., at a price comparable to that involved in the production of natural rubber, which is an ideal small-family industry. In the future, it should be possible with fully mature plantations of high-yielding trees to produce rubber at ten cents a pound or less.

As indicated above, rubber production is an ideal small-family industry. The Goodyear Rubber Plantations

Company, which has carried on experiments with tropical American rubber production since 1935, has emphasized that, in the development of rubber production in this hemisphere, small plantings can play an important role. Although there are some large plantings, like those of Goodyear in Costa Rica and Ford in Brazil, in the future local farmers in those countries will be encouraged to make small plantings of a few acres and to utilize the large plantations and the cooperative experiment stations of the U. S. Department of Agriculture as sources of planting material.

No tropical crop is more suitable for farm production than is rubber. The mature trees are tapped and the latex is converted into dry rubber, usually smoked sheets, by a simple process which may be carried out with an investment in equipment of as little as \$50. The equipment required consists of such materials as discarded oil drums, homemade wooden paddles, and crude smoke-houses built with local materials.

In the Far East over half the rubber is produced on individually-owned farms of less than one-hundred acres each. To bring these farms into production the grower must wait from five to eight years before the trees are tapped and bring him a cash return. These growers use part of their land for producing food crops and often interplant the rubber trees with such

tropical crops as coffee, cacao, bananas, and rice.

The good wages which rubber production brings the small family unit, providing them a cash income to supplement the living they get off their place, helps to develop contented rural populations.

Vice President Wallace, in an article that received widespread attention ("Against a New 'Isolationism,'" in the *New York Times Magazine*, July 12, 1942) said: "Looking ahead to the new time of peace, the motorists of the United States will not only want to have an assured source of rubber, but they will want to get that rubber as cheaply as possible. In the matter of cost, natural rubber from either the Far East or the Western Hemisphere is likely to have a big advantage over synthetic. And, even if synthetic rubber is available in large quantities at a low price, a substantial amount of natural rubber still be needed for mixing with the synthetic product.

"Few automobile users in the United States realize that the technology of producing rubber from trees is changing almost as rapidly as the technology of producing synthetic rubber. During the last ten years, higher-yielding strains of rubber have been developed. Some of these strains yield two, three, four, and even five times as much as the old-fashioned strains customarily used in the Far East. With modern strains of the

Hevea rubber plants, there is every reason to believe that during the period after the war rubber can be profitably laid down in New York City from either South America or the East Indies at less than 10 cents a pound."

As previously indicated, natural rubber, under modern conditions, should not cost more than ten cents a pound to produce and probably will be produced for less. There is no question that the continued and increased production of natural rubber is to the interest of the consumer, and it is my hope that as time goes on it will gain as much support as is now back of the synthetic rubber industry.

In this discussion, so far, I have dealt exclusively with Hevea rubber in referring to the natural product. Hevea is preeminently the most important species for commercial rubber production, but there are other kinds which offer great possibilities, not only from the standpoint of low cost of production under proper conditions but specific qualities. In certain areas in Mexico and Central America conditions are more favorable to the growing of Castilla than Hevea rubber. In those areas, however, as in the West Indies the *Cryptostegia* plant, a source of high-quality rubber, appears to offer possibilities.

Cryptostegia rubber under present conditions might cost as much as seventy-five cents per pound. Indications are, however, that with continu-

NATURAL RUBBER PRODUCTION IN THE AMERICAS

ed research and experience in growing it, it may be possible to bring its cost per pound down to that of Hevea rubber. Under ordinary growing conditions it will produce 400 to 500 pounds of rubber per acre. Under the most favorable conditions, that is, with fertile soil and high rainfall, it is a potential source of more rubber per acre than any other rubber plant known. It is believed possible with proper horticultural practices to stimulate its fast-growing young water shoots or branches to yield over a ton of rubber to the acre.

At present there are many unknown quantities in the production of *Cryptostegia* rubber. Good techniques for it cannot be worked out until large-scale plantings are in production. As yet not even the important operation of tapping has been completely worked out for *Cryptostegia*. In areas where labor is plentiful it may be found practicable to cut the young shoots of the *Cryptostegia* vine so as to have the latex drain into cups as in tapping operations with Hevea or Castilla rubber. It appears more probable, however, that the mature vines will be cut and gathered by some mechanical means and the latex extracted chemically.

Just what the chief source of our rubber will be ten years from now no one can say with certainty. All signs, however, point to natural rubber as the product on which we shall continue to rely in the future. Natural

rubber has served our needs well in the past and there is every indication that it will continue to do so in an increasing satisfactory way as time goes on.



Hercules Reports for 1944

In a summary of the achievements of Hercules Powder Company during 1944, Charles A. Higgins, president, reported that millions of pounds of explosives, including rocket powder, had been supplied directly to the Army and Navy by ordnance works which, though government-owned, were designed and operated by Hercules. In addition to these materials, Hercules supplied plastics bases, protective coating materials, insecticide bases, soil-stabilizing resins, synthetic resins, flameproofing ingredients, chemical cotton and industrial explosives.

Several thousands of Hercules employees are serving in the armed forces, and many have died in the service of the country. Sergeant William Lloyd Nelson of the Hercules' Home Office, who was killed in North Africa, was awarded the Congressional Medal of Honor, and in November a Liberty ship was named after him.



Herman Brooks, president of Coty, Inc., and president of the Toilet Goods Association has been elected vice president of the New York Board of Trade.

South American Trade Survey

A trade survey of South America, in digest form, has been published by Pan American-Grace Airways, Inc. This survey will be distributed only through accredited travel agencies, and was designed to stimulate American trade by air to prepare the way now for expanding business relations with South America after the war.

The countries covered by Panagra's survey include Panama, Colombia, Argentina, Ecuador, Peru, Bolivia, Brazil, Chile, and Uruguay. Information compiled by the United States Department of Commerce, trade balances, import commodities, area and population figures, present and proposed and air services, are given for each country.



Lincoln T. Work, F.A.I.C., director of research and development, Metal and Thermite Corporation, opened the symposium on "Metallurgy" held by the North Jersey Section of the American Chemical Society, in Newark, N. J., on January eighth.



Gustavus J. Esselen, F.A.I.C., spoke at a luncheon held during the Annual Meeting of the Textile Research Institute, on "The Textile Industry—Rebirth or Second Childhood?"

Gustav Egloff, president, A.I.C., spoke before the annual convention of the Northwest Petroleum Association, held at the Hotel Radisson, Minneapolis, on January 4th, on the subject of "Present and Post-War Petroleum Products."

Chesterman Award Established

The American Bottlers of Carbonated Beverages, 1128 Sixteenth Street, N. W., Washington, D. C., announce the establishment of an annual Chesterman Award, consisting of a certificate and a cash prize of \$1000, to be given to the individual who has made the most outstanding scientific or technical contribution to the progress and advancement of the soft drink industry during the year.

The award is open to post-graduate students, college technical men, and independent research workers, as well as to technical men in the soft drink and related industries.

The award is named in honor of C. B. Chesterman, soft drink manufacturer of Sioux City, Iowa, and former president of the association.

Alan Rattiner President of Henlan, Inc.

A. Alan Rattiner, F.A.I.C., formerly general manager of the Odell Company, Newark, N. J., is now president of Henlan, Inc., manufacturing chemists at 160 Cortlandt Street, Belleville 9, New Jersey.

What Shall We Do With Germany?

E. Gordon Fox

Vice-president, Freyn Engineering Company

"What to Do With Germany After the War" was the subject of a symposium held by the Chicago Chapter of THE AMERICAN INSTITUTE OF CHEMISTS recently.

Three points of view were represented: Dr. Otto Eischiml recommended stripping Germany of its scientific laboratories. (His paper, under the title, "Post-War Enemy Number one," appeared in the September issue of THE CHEMIST.) The conservative method of dealing with Germany was discussed by Mr. E. Gordon Fox, and the liberal attitude toward handling relations between human beings was presented by Dr. A. J. Carlson. These latter two papers appear here.

fundamental factors and have endeavored to treat with them dispassionately.

What shall we do with Germany? This question arose once before, in 1918. It is obvious that the solutions reached at that time were not altogether correct, otherwise we would not again be confronted with the same problem.

What shall we do with Germany? The subject of this sentence is "we," and it is tremendously important. For if something is to be done with Germany, there must be somebody to do it. If rules are to be laid down and restrictions are to be imposed, they must be enforced. We cannot agree upon settlement terms, write them on a blackboard and then let them be gradually effaced. Whatever the terms, Germany must be supervised and policed for a long period of years. The enforcing entity must not be subject to disintegration; rather, it must continue to function effectively, it must maintain its prestige, it must be in position to enforce its decisions, and it must convince the Germans of the futility of any policy of noncompliance.

THE topic under consideration is challenging in its nature, tremendous in its scope, and vital in its importance. This paper presents merely the highlights of the whole problem. By way of engineering approach, I have tried to direct attention to

The principal allies at the end of World War I were the United States, Britain, France, Italy and Japan. Before the enforcement of the Versailles Treaty was well under way, the United States was on the side-lines. A process of disintegration promptly set in. Twenty years after Versailles we find two of the original allies in the common axis with Germany.

In 1936, when Hitler's relatively weak forces reoccupied the Rhineland, France desired to take immediate steps. But she could not obtain backing and she was unwilling to act alone. The opportunity to nip aggression in the bud was lost.

Hitler plunged Europe into war only because he observed division and discord among the former allies. Had this lack of teamwork persisted, Hitler would have won. Only through collaboration are we achieving victory, and only through similar collaboration can there be hope for a lasting peace.

It is almost futile for us to discuss what is to be done with Germany unless we agree, as a prerequisite, that an international organization is to be set up as an enforcing, supervising and policing agency, and unless we firmly determine to participate actively and permanently therein. The extent to which we can insure the adequate and sustained effectiveness of such an agency is a prime factor in the very determination of the policies which it will be required to enforce.

International collaboration is for

us both the premise and half of the answer to our question.

Germany is indicated with having instigated five wars in the course of one century. Such a record would seem to indicate the existence of some basic and chronic ailment. This ailment seems to be susceptible of diagnosis. To give the disease a name, we might say that Germany has suffered from political anachronism.

Great Britain, France and the United States attained national status and developed democratic forms more than a century ago. Industrialization and consequent growth were imposed on essentially healthy structures. Russia underwent scant industrialization so long as she remained an absolute and feudal power. But in Germany industrial development was imposed on an area subjected to national disunity and not yet enjoying political democracy. The German nation dates but seven decades and the Weimar Republic, set up in 1919, after World War I, was its first taste of democracy.

Unification of Germany was effected largely under the iron rule of Bismarck, on a basis which gave the Prussian military leaders a dominating position. These leaders represent a caste of large Prussian landowners or feudal barons, known as Junkers, a distinctly reactionary element. Industrialization of Germany did not assume a democratic base, with the ownership and a voice in the control

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widely disseminated, as in the U.S.A. Rather, industrial ownership and power were more or less centralized in the hands of the few and the feudalism which affected agriculture also pervaded industry.

With this brief resume as a background, we may proceed to consider what disposition is to be made of Germany post-war.

Of first importance is the determination of our objective. Are we primarily interested in meting out to Germany a punishment suited the enormity of her crimes against civilization, or are we primarily interested in eradicating the causes of Germany's unrest and in alleviating the conditions which have retarded the progress of all of Europe. If, abstractly, we favor the latter course, is it possible and feasible?

Some may say that the choice lies between a harsh peace and a soft peace. I would prefer to define the choice as a vindictive peace versus a constructive peace. It is my opinion that the constructive peace is the logical choice and I submit that this does not preclude an adequate degree of sternness and firmness. It is secondarily a question what we are to do with Germany and primarily a question what we are to do for Europe's future.

Realizing the many benefits accruing from our Union of States, it is not difficult for Americans to visualize some sort of Federation of Nations as

a most desirable objective for Europe. It would promote a freer interchange of goods, it would enlarge the scope of markets, and would combat the trend to extreme nationalism, self-sufficiency and compartmentation which straight-jacketed European trade in the recent pre-war decade. It would minimize the importance of boundaries and would automatically solve the foreign minority question. It would serve as a distinctly unifying influence.

Many factors render the realization of a European Federation difficult. Among these are:

1. Unequal levels of political and economical development in various European nations.
2. The smaller nations fear that Germany would attain a position of domination.
3. Britain and the Soviet Union are not primarily European powers. They have a divided interest.
4. A European Federation could not be organized without the sponsorship of Britain, the Soviet Union and the United States. Such sponsorship will not be immediately forthcoming.

It is Utopian to except a European Federation of nations as an immediate accomplishment, but it is not Utopian to envisage it as a development of the next generation, provided the actions taken now favor rather than forbid that eventuality.

The Treaty of Versailles prescribed the treatment to be accorded to Germany quite rigidly and with considerable finality. Subsequent modification became necessary and repudiation was the eventual outcome. There appears to be merit to the contention that the peace terms to be established this time should be more flexible, permitting development or adjustment in the light of forthcoming events. Among other advantages, such an arrangement might put Germany on her good behavior. It would give her some hope and some incentive to work her own way out of her predicament, and eventually to earn for herself a standing among reputable nations. Conversely, it might permit the degree of restraint of Germany to be adjusted from time to time in accord with the indicated need.

In brief, Versailles prescribed rigid terms but failed in their enforcement. This time we should lay stress on the enforcing agency, and we might well leave to its decision many questions which can be worked out to better advantage in the light of future knowledge.

We will now proceed to consider several aspects of post-war treatment of Germany. The first of these is the matter of punishment.

It would seem to be futile to attempt to punish all Germans on the theory that they are collectively accountable. The tremendous losses and the privations which they will have

suffered in the war, added to the penalties inflicted by way of reparations and restitution, and the stigma of defeat and hatred should impress them sufficiently that war does not pay.

We erred badly after World War I in our failure to crush the martial factors in Germany. We did not invade. We did not go to Berlin. We did not punish the Kaiser and his accomplices. We did not require military authorities to sign the Armistice of 1918, thereby explicitly acknowledging their defeat. All of this allowed the Germans to save face. More serious, we did not disturb the Junkers. This military caste, which included the German general staff, was temporarily quiescent, but it served as the nucleus for the reactionary opposition to the Third Reich, eventually regaining its old power. It is generally conceded that the Nazis, the Junkers, and the large industrialists and bankers who collaborated with the Nazis to gain their own ends, were the moving forces which nullified the attempt to establish a democratic government in Germany.

This time we must delve to the roots and eliminate basic causes. This requires that we seek out and punish all individuals responsible for illegal transgressions of the Nazi government, and all those guilty of inhumane, unlawful acts against civilian populations. International tribunals should be set up for this purpose.

WHAT SHALL WE DO WITH GERMANY?

Trials should be eminently fair and should be public.

It may prove to be a difficult matter to apprehend many of the Nazis. They have learned from the French Maquis and the Yugoslav partisans how difficult it is to capture guerilla forces entrenched in the mountains. The Nazis are likely to try this means of escape, figuring to bide their time until once more they can undermine the presumably weak and struggling newly-established government. If we are able to do a thorough job of bringing Nazis and other responsible persons to trial, a lasting peace may not be too difficult of attainment. If we do not succeed in so doing, much greater precautions in other directions will become imperative.

We may next give some thought to the matter of boundaries and to the possible subdivision of Germany.

The question of boundaries is too extensive to consider in detail but it may be observed that the existence of an international organization should insure against attempted revision of boundaries by force, and might also provide an instrumentality for modification by peaceful negotiation. The principle of self-determination should be recognized as a factor but not as a sole determinant. Economic practicality should be considered. The stripping of Germany primarily to handicap her recovery would likely be a boomerang. The long term welfare of all concerned demands that justice be

the prime consideration. Last, but not least, it should be endeavored to reduce the significance of boundaries by minimizing their economic importance; that is, by better European coordination.

It appears to be quite definitely settled that, for purposes of initial occupation, Germany will be divided into three or four parts administered by British, Russian, American and perhaps French authorities respectively. It has been suggested that such a division of the country should be made permanent. It is argued that no one of the subdivisions of Germany would be able to start another war with any prospect of success. It may be further argued that there are substantial differences in the people; the Prussians in the north, Protestant and military; the Saxons in the Center, Protestant, commercial and industrial; the Bavarians in the South, Catholic, agricultural, artistic. Still further, it is pointed out that smaller European countries, such as Sweden, Switzerland and Holland, have prospered more than Germany and that they have a record of a century or more of peace. If it were possible to establish a Federation of Europe, subdivision of Germany into two or three parts would meet with less objection and the fear of Germany's domination of the Federation might also be diminished.

The following are principal counter-arguments:

1. The curse of Europe derives from the fact it is composed of many separate nations which have never been able to reconcile their differences or coordinate their mutual interests. What Europe needs is more political unity, not more subdivision.

2. Dismemberment of Germany would not add to the prospects for stability in Europe. It would be a reversion to conditions from which the Germans have been slowly and painfully emerging. The disunited states would only strive to unite once more under some nationalistic leader. This would precipitate new disorders. The integrity of the territories historically controlled and ethnically settled by the Germans is the one issue which, more than any other, unites them and for which they would be willing to fight.

Hitler said in *Mein Kampf*: "The problem of regaining German power is not: how can we produce arms? but how can we produce the spirit which enables a people to bear arms?"

The question of reparations proved a stumbling block after the last war. It will be no less difficult this time. At one extreme of opinion are those who consider that reparations are impractical and that none should be levied. At the other extreme, it is certain that Germany could never pay the maximum which the United Nations would be justified in requiring.

In determining the amount of reparations, practicality would seem to

be the prime consideration. The amount should not be such as to smother all German incentive and foredoom the failure of the new regime. It should not be such as to raise extreme animosity in the Germans. It must recognize the fact that only a reasonably prosperous Germany can make appreciable payments. It must consider that payments can be made only in goods and services which the United Nations will be willing to accept only in a limited measure.

Russia has intimated that she may demand the labor of ten million German workers for a period of ten years to compensate for the destruction that Russia has suffered. There is probably ample justification for such a claim. Moreover, Russia might well be able to accept this amount of foreign help without prejudice to her own economy. However, when we consider that there were only twenty-three million employed in Germany in 1929, it would appear that this demand is rather more than Germany could shoulder.

In summary, the amount of reparations should be as much as but not more than is compatible with Germany's economic survival and her consequent establishment on a healthy political basis. Perhaps this is another matter in which an international organization can function in adjusting the price to what the future traffic will bear.

In the matter of disarmament, our

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position should be strict and firm. We should require substantially complete immediate disarmament in all categories, and we should require the destruction of specialized facilities for production of armament and munitions. We should prescribe unilateral disarmament for Germany indefinitely. The Germans must recognize this as the penalty for their aggressions. We should afford such supervision as is necessary to the effective enforcement of these measures.

It may be remarked that disarmament would be a constructive measure, as well as a safeguard, as it would relieve an impoverished Germany of a burden she could ill afford to assume. It is believed that the German people can be reconciled to the idea of unilateral disarmament, if the matter is tactfully handled, if our general policy is constructive, and if we are reasonable in other directions.

There are some who consider that Germany's heavy industry should be destroyed, or that it should be greatly restricted in order to limit her military potential. Generally speaking, I believe that there is a tendency to over-emphasis. Now that the horse has been stolen, we desire to put a triple lock on the barn door.

Some seem to harbor the idea that Germany could prepare for war surreptitiously and could surprise us in another attempt at aggression. I do not think that past experience supports this view. Hitler had already

written *Mein Kampf*, charting his intentions, when he came into power in 1933. Military occupation of the Rhineland in 1936 was adequate proof of the trend of events. Ambassador Dodds in Germany and Ambassador Davies in Russia were convinced that war was in the making, and they warned our government in no uncertain terms. In my brief stops in Germany in 1937, the tenseness of the situation could be easily sensed. In 1939 German industrialists were talking openly about the amount of "war work" in process in their plants. Russia saw what was coming as early as 1930. She prepared. America stood by in a stupor of unreality, permitted Hitler to build up his strength in increments, and was charmed by the fable that because we "hate war," we could escape the deluge. Hitler got a five year running start while Britain, France and America bowed in appeasement.

It required most of two years for America to prepare to take an effectual part in this war. Military preparations for a modern large scale war cannot be made overnight, nor can such wars be bred secretly. We need not swing from the extreme of past laxity to the other extreme of future repression. If we maintain reasonable surveillance over Germany's activities and, if we are prepared and disposed to act promptly in response to early symptoms, we can definitely prevent Germany from again becoming a mil-

itary menace. It is less a question as to what we permit Germany to do; it is more a question as to what we are going to do ourselves. If we are not disposed to "follow through," the temporary imposition of even the most stringent terms will not prove effective, in fact, they will have quite the opposite influence. Durability, rather than severity of restraint, should be the dominant note.

The most desirable disarmament of Germany is mental disarmament; the removal from power of war-breeding elements; the prevention of their return to power; the minimizing of arbitrary actions which might serve to again arouse the antagonism of the German people; and the diplomatic convincing of the Germans that war does not pay.

The German people will not be well prepared to take upon themselves the task of government immediately post-war. A decade of dictatorship, under which all freedom of action and expression has been stifled, does not stimulate leadership. Germans will first have to establish their own local governments. From these a centralized government may gradually evolve. Initially it will be confronted with many difficulties. It must therefore be sheltered more or less by the occupying powers or by the international organization which may take over their guardianship. But it is desirable that government from the outside be minimized and that Germans take

over the full responsibility of working out their own solution of the predicament into which they plunged themselves.

It would seem to us to be very desirable that Germany again be established as a democracy. The aggressors in this war were totalitarian, and the democratic countries were only reluctantly embroiled. As a democracy, Germany was peaceful. It was necessary first to destroy the democracy. Then the cunning and purposeful Nazi leaders were able to cajole the people step by step into war, and thus to their downfall.

Post-war, some Germans, at least, will crave for personal liberty. Two wars and two defeats in three decades, and the severity of the Nazi regime, will have taught them the meaning of personal freedom. They will appreciate the significance of democratic liberties.

On the other hand, it must be realized that the Weimar Republic was not an unqualified success, and that the post-war crisis in Germany will be so severe that a revolution is not improbable. Radical solutions may find favor. A soviet form of government is not an unlikely outcome. German nature leans to the authoritarian.

It does not seem advisable that we attempt to impose democratic government from above. In the first place, there is a wide disparity among the political systems of the United Nations themselves. In the second place,

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foreign dictation or prescription of Germany's governmental form would in itself be repugnant to our ideals of liberalism and democracy.

The Germans should be permitted to decide for themselves the pattern of their political organization, within limitations. We could not tolerate the re-establishment of any form of Fascism and we must require that the new government be not disposed to militarism and aggression, that it recognize the legal equality of all of its citizens, and that it be ready to cooperate with the occupying powers or the international organization in the endeavor to build a better and more peaceful Europe.

Germany's political future is closely related to her economic future. It was earlier pointed out that, both in agriculture and in industry, economic power has been concentrated in an oligarchy which opposed the growth of democracy. Furthermore, due to the exploitation of her people, the inadequacy of Germany's domestic market for consumers' goods was accentuated.

It is perhaps significant to note that a German workman had to put in more than twice as much working time as a Dane or a Norwegian in order to purchase a representative lot of staple goods, and substantially more working time than a citizen of any of the other principal European countries. As a consequence of this situation, a disproportionate amount

went into capital goods which expanded Germany's production capacity beyond her ability to establish foreign markets. This condition probably added to the depth of her depression and made Germany ripe for Hitler's demagoguery in 1933, based on the panacea of military preparation as a means of providing employment.

The best possible insurance against future German wars would seem to be the removal from positions of political or economic power of those forces which seek to perpetuate the principles of aggression and the domination of the many by the few.

In view of its close identity with Hitler's war effort, and its operation pre-war on the basis of cartels and artificial government stimuli, Germany's economy would probably find it difficult to function post-war entirely on the basis of free competition and private enterprise. It will be difficult to import necessary raw materials and to initiate foreign trade in international free markets.

There will likely be much pressure favoring socialization of heavy industry. It will probably be argued that, as the leaders of large business were participants in Hitler's plans for aggression, their properties should be expropriated as some degree of compensation to the whole population. We may not care to pass on the merit of this argument. Many of us will no doubt regret this trend to further encroachment by government upon the

system of free enterprise, but we should recognize that through such an arrangement, one major factor contributing to militarism in Germany would be removed. Misdirected power invites retribution.

Again referring to the proposal that Germany be denied the opportunity to re-establish her heavy industry, we should realize that post-war there will be a substantially higher population density in a smaller territory than existed pre-war. Even then Germany had an unemployment problem and voiced a need for more "lebensraum." It appears that, at best, less than one quarter of the post-war population could be supported directly or indirectly from agricultural pursuits. To expect the remainder of the people to derive their subsistence solely from light industry requires considerable optimism.

It also appears doubtful that Germany can achieve a reasonable balance between imports and exports, especially if her imports take a form other than that of raw materials. The logical solution lies in a compromise under which Germany's heavy industry might be restricted and supervised but would be allowed to function with sufficient effect to serve as a basis for dependent industries.

Restriction and supervision of Germany's post-war industry does not present insuperable difficulties. Her steel industry could be controlled through limitation of imports of iron

ore, and especially the alloying materials such as manganese, chromium and nickel, of which Germany has no domestic source. The production of aluminum can be controlled in view of the lack of domestic bauxite. The regulation of aluminum production is facilitated also by the magnitude of plant required and by the attendant large consumption of electric power. The restriction of Germany's production of synthetic motor fuel from coal would be an effective measure and should not affect Germany's economy seriously since the cost of producing this fuel renders it non-competitive with imported petroleum.

It would seem to be rational, at least temporarily, to prohibit or to restrict the manufacture of airplanes. The right to engage in civil aviation should probably be abridged. Control of electric power production and the supply of a part of Germany's power from neighboring countries are practical expedients.

Any one of these measures would restrict Germany's war-making power; the combination of several measures would render her militarily impotent. Such is the import of a recent joint statement signed by the Presidents of five of Americas foremost engineering societies.

In view of the greatly damaged condition of Germany's heavy industry and its probable depletion for restitution, and the further fact that this time she will not have extensive Brit-

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ish and American credits to aid her, the question may not prove to be whether Germany should be allowed to re-establish her heavy industry but, rather, whether she will be able to do so expeditiously enough to meet the requirements of post-war recovery.

There may be merit in the proposal to supervise research, but it would not seem to be feasible to carry this plan to such an extreme as to cripple effective production, or to deny the world all benefit of German creative genius. We should not overlook the fact that invention, the peaceful conquering of industrial frontiers, has proven to be a most effective means of absorbing labor surpluses, a matter of prime importance to Germany and one closely related to the prevention of unrest.

It has been amply demonstrated that peace cannot be insured by the signature of documents. It is yet to be proved what can be accomplished through a system of international collaboration. These may be good props, but they must not be mistaken for substance. They are useful instrumentalities but they cannot supplant the forces by which they are controlled.

In this paper, I favor American participation in an international organization, one eventual function of which might be the guardianship of the peace with Germany. This position is based on the belief that a policy of isolation is unrealistic and imprudent in the face of a rapidly skinking

world and our expanding trade.

If we accept the postulate that America must participate, in increased measure, in world politics, let us not merely sit in on the old poker game of balance of power; of conflict of interests seeking dominion and domination and advantage. Traditionally this game is steeped in secret diplomacy and perfidy. It leads always to war.

Is it not better that we try to organize a new way, with new rules, played above the board, in the light of publicity, more in keeping with democratic principles and with some semblance of fairness to all? Such a project, if honestly and justly administered to afford the greatest good to the greatest number, might possibly succeed. We are not so naive as to expect the full adjustment of such an ideal but the measure of our approach may well be the measure of our progress in the direction of a warless world.

We are suckers for panaceas, -isms and deals which promise soft and easy solutions. We heed the confidence man, bearing an aladdin's lamp, offering a simple cure-all for our complex maladies. But there is no short cut to the millenium. Under any flag and any -ism, wealth results only from production and from thrift. Similarly, there is but one road to peace. It is the hard way. It demands understanding, tolerance, forbearance, justice and humanity of man to man.

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Building Stones for a More Durable Peace

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A SEARCH for and an examination of buildingstones for a durable world peace assumes some knowledge of the nature and history of man, and the multitudinous and complex causes of war. The nature and the behavior of man throughout recorded history are more a matter of demonstrated facts and less a matter of wishful thinking than are today's sundry programs for a durable peace.

I. Quotations

I wish to start out with a few quotations bearing on my topics, some old and well-known, others engendered in the hate and fear of the present war:

"What you do not like when done to yourself do not do to others."—Confucius.

"Whatever you would that men should do to you, do ye even so to them."—Mathew, ch. 7.

"With malice towards none, with charity for all."—Abraham Lincoln.

"We can have peace and we can have vengeance but we can't have both."—Herbert Hoover.

"Only a peace between equals can last; only a peace the very essence of which is equality and a common participation in a common benefit."—Woodrow Wilson.

"Civilization is a willingness of all to come to the defense of each."—Norman Angell.

"Until there is correct thought there cannot be correct action."—Henry George.

"As the military situation and all the excitement and animal emotion accompanying the fighting recede from the foreground, the problems which gave rise to this war emerge through the smoke and the wreckage in no way simplified by the Roman holiday in which we have indulged. There stand the problems like the bills with interest, which we could postpone paying while on vacation, but can no longer postpone. In short, we may now soon return to where we left off twenty-five years ago, except that the problems then facing us have been immensely aggravated."—Prof. G. A. Lundberg: *Sociologists and the Peace*, Am. Soc. Review, Feb. 1944.

"If German youth and German civilian life are to be reoriented, the economic as well as the spiritual resources must be available . . . If our

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peace terms are not going to allow Germany to engage in defense-related industries, positive policies providing for alternative employment must be formulated and adopted, or the idleness resulting from our peace terms will provide a new temptation to another incarnation of German militarism."—President Harry D. Gideonse, Brooklyn College (*The Humanist*, 1944, p. 126).

"A peace that is to endure must rest on the consent and cooperation of men and women of goodwill in every country including 'enemy' countries. In the words of the Atlantic Charter, 'all nations, large or small, victor or vanquished,' must be accorded freedom and the opportunity to live decently. The Dumbarton Oaks program seems to us to be an attempt on the part of the 'Big 3' to dominate the world. It would demand of us that we sign a blank check to support with our blood whatever secret settlements may be agreed upon now or later by Stalin, Churchill and our President. No such coalition has ever lasted long."—National Council for Prevention of War, Oct. 1944.

II. The Causes of War

Wars have been waged throughout human history; Wars between individuals, families, tribes, and nations, as well as between different social, economic, and religious groups within nations. The latter are our civil wars: The haves versus the have-nots; slaves versus masters, Dukes versus Dukes, Christians versus heathens, Moham-medans versus Christians, peasants versus overlords, etc. The most fundamental common denominator lead-

ing to these mortal combats appears to be the will or urge to live, something man has in common with all other beasts. The drives for food (hunger), mates, slaves, and land for hunting and food crops have had and still have some survival value for the individual man in the perpetual "struggle for existence."

In raw nature survival may be largely determined by brute force, agility, guile, and deceit. The increase of the human populations in every land has by necessity led to the development of other drives or values and modes of behavior essential for human survival and progress. Through this evolution of social mores, laws, and regulations, significant wars are now confined to internal revolutions by violence, and wars between nations or groups of nations.

Dr. C. P. Haskins (*Ants and Men*, 1939, p. 205) says: "Ancient man killed, pillaged, and stole whatever he could without any attempt to spare his less competent neighbor, when competition arose. There was little mercy in early Europe during the *Celtic* invasions . . . and but little more when the *Celts* in turn were displaced by the Roman legions. The Egyptians seem to have made no concessions whatever in their relentless drives which pushed the more barbaric tribes to the darker part in Africa, and we must imagine similar relentless pushes by the *Japanese* against the *Ainu*, by the Norsemen at Lindisfarne,

by the Spaniards in Latin America, and a thousand other instances Modern man, despite his pride in greater enlightenment in dealing with vanquished peoples, proceeds in much the same fashion."

But even in our more modern, so-called civilized nations, most of the primitive drives to violence and war persist in man. We still have hunger, greed, pride, political and religious propaganda, fanaticism and intolerance, racial prejudices, vanity and commercial rivalries. The last, in its antisocial aspects, is mainly an extension of our primitive selfish greed toward other nations' territories, natural resources (such as oil, rubber, minerals), and products which our technological and industrial developments have rendered important for life and developments in our own and other lands. Political faiths and fanaticisms have in our generation largely replaced religion as a drive to international war and violence. We no longer wage war to secure slaves, but some nations still resort to force and wars against other lands and peoples, primarily for commercial exploitation. This is man's primitive greed.

Except as checked by disease, epidemics, violence, and wars, all animals (man included) appear to have sufficient powers of reproduction so that the population ultimately exceeds the capacity of the respective lands to furnish enough food to satisfy biologic hunger and the food needs for health,

despite man's growing understanding of agriculture and animal husbandry. That stage is already at hand, specifically in England, Belgium, India and China.

As a temporary measure, the excess population in these countries can or could be fed by imports from lands less densely populated, provided there is freedom of commerce and the wherewithal to purchase. But sooner or later the less densely populated lands will have enough or more than enough people to consume all the food the land can produce. For modern science and the art of medicine reduces deaths from disease, and many people in many lands consider the injunction: "Be fruitful and multiply" as a sacred edict from God.

My experience in Europe in World War I, my later observations in the Orient, and some acquaintance with biology and man's past have convinced me that excess population, and its sequelae: Unrest, migration, etc. is still a factor in some recent wars, that this factor must be reckoned with by every statesman who honestly endeavors to build a more durable world peace. For the potency of overpopulation, unemployment and hunger as causes of war will grow with the years, unless understanding can temper the sex drive and modify religious dogma in the direction of planned parenthood. The other alternative, scuttling our modern science and art of

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medicine appears to me entirely out of the question.

Dr. Robert F. Griggs, Secretary, Division of Biology and Agriculture, National Research Council said recently: "The food policy as it is now being formulated by the Interim Commission of Food and Agriculture set up by the Hot Springs Conference of the United Nations is the best device yet brought forward for preventing future wars. Should we decide and should we succeed in providing every human being enough to eat to maintain health and capacity to work, that program would be less expensive and more effective in preventing future wars than continuous armament of the United Nations."

But planning is not execution. Even if this feeding plan was feasible, and was carried out by the world's ablest and wisest men of good will, the world population, unless checked by intelligence, pestilence, or war will in time outdistance the world's food supply. So, wise men, striving for a more durable peace should not put all their shekels on this horse.

All the higher animals (man included) appear to react to strangers with a mixture of fear, distrust, and disdain. In the case of man, if the stranger speaks a different language, has a skin color different from our own, different facial features, employs different religious rituals, and wears different clothes, such differences are readily translated into signs of inferi-

ority. In such soil sprout our current concepts of the "heathen," the "hun," and the "lesser breeds," outside the pale. The well established fact that, biologically, modern man is one species has so far made little impression on our ideas, prejudices, and behaviors towards the people across the national border or across the ocean. But the clear recognition of the biological unity of modern man will not by itself abolish war. For we have murderous "family feuds" among people of identical strain and culture.

The fact that the English, the Germans, the Dutch, and the Scandinavians are first cousins has not been sufficient to render their relations one of understanding, good will, and peace. But the recognition of man's racial unity should, in time, dilute, if not obliterate, racial prejudices, discriminations, hates, and fears. For the behaviors based on these old and false views and emotions are not to be minimized as factors leading to many wars.

The modern means of international intellectual communications (the press, the radio, books) could and should be used as effective means towards adult education on the true nature and history of man, and thus help to dispel in all lands the powerful prejudices and actions based on ignorance, vanity, fear and greed. But, as with the instruments of modern science, these modern means of intellectual communications are frequently

used to intensify these fears, greeds and prejudices. The international gangsters and the domestic demagogues are skilled in false and partly false propaganda, particularly in times of war.

This propaganda delays the attainment of an early peace, and plants the seeds for the next war. All wars, and particularly modern wars, entail acts of brutality, sanctioned by our current international mores. But as with-in every nation, even in times of peace, individual and organized acts of brutality not so sanctioned are bound to occur, do occur in war. When we add to these the propaganda stories of brutalities on the part of the enemy peoples, manufactured solely for the purpose of painting the enemy more bestial, inhuman, dreadful, and unjust than he is, it should be clear to most intelligent people that war, and more especially modern war, is not the path to a more durable peace between nations. It worked in our own Indian wars by nearly dispossessing and exterminating the Indians. Modern global wars add greatly to man's primitive greeds, misunderstandings, hates, fears, and drives to war. They render the soil more fertile for the next crop of the poisonous weeds.

III. A Durable Peace

To fit into an edifice of a more durable peace, every building-stone must be hewn close to the lines of the "Golden Rule." This applies both to the plans and to their execution. The

latter is the more difficult task for it calls for wise men of good will. These are not overabundant in any land. We had experience with the other type of administrators of conquered states in the "carpet bagger" period following our war between the States. The northern "carpet baggers" appear to have created more ill-will in our southern states than did the war between the states itself. If that could and did happen here among our own people, it is going to be much more difficult to hold such practices down even to our own post civil war misfortunes when the victors and the vanquished are different races with different cultures.

1. The turning of the enemy's words and cannons into plow shares—total disarmament,—seems obvious and fair, *provided* the United Nations are sincere and take concrete steps towards their own gradual disarmament. A world half armed and half disarmed fits neither the Golden Rule nor the "Atlantic Charter." Peace in such a world will not endure.

You will note that I am in complete agreement with H.R.H., the Duke of Windsor, who says: "It is along the road of cooperation and understanding that the thoughts of mankind must travel if we are to arrive at a world of enduring peace among men of good will." (*Reader's Digest*, Dec. 1944).

2. Arrest, trial and punishment of the men in the enemy nations accused

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of greater crimes than those permitted under the rules of civilized warfare, seem obvious, just and fair, *provided* anything approaching due process of law for the accused individuals can be attained in any warring country when the battles cease. All the warring nations are killing and maiming women, children and civilian men by the tens of thousands in enemy countries. There are probably individual war acts even more bestial. These facts, plus the manufactured propaganda, are going to render fair and factual legal procedures against individuals most difficult in the warring nations for some time to come.

3. As to any significant financial or other forms of reparations and restitutions for the destruction of life and property in other lands by the defeated nations, such measures were a part of the treaty which ended World War I. It did not work. Even if it was altogether just, the damage to life and property probably can not be paid in any substantial way. "Everybody loses when forests burn." That seems equally true and equally unavoidable in the case of global wars.

4. Dividing Germany, Italy, Japan, Bulgaria, and Rumania into smaller states, as proposed in some quarters can be done by force, but it will not make for a more durable peace. Such a step will create not "freedom from want and fear," but misery, resentment and hate, for it will disrupt established and workable economic re-

lations. Voluntary federations rather than forcible separations appears to me the wiser path to peace.

5. It has been proposed that the United Nations prescribe and administer the principles of education for the children and youths of post war Germany and Japan, on the theory that it is primarily the German and Japanese education of their youths during the last twenty-five years that led to this global war. Far be it from me to assert that this education, or rather its basic assumptions, had nothing to do with starting or prolonging this war. So far as I have reliable information on this matter, the ethical tenets of this education did not square with the "Golden Rule."

But, lest we forget, the ethics of the New Testament have little in common with what our so-called Christian nations do to each other. *What we are and what we do at home and in the world at large speaks louder than anything we may say in the school house or in the class room of post-war Germany and Japan.* In all the parts of the world the primary ethics of children and youth are imparted by parents and by religious leaders. In view of that fact, the above proposal seems both fantastic and unworkable. But even could it be carried out, the enduring lesson to German and Japanese children and youths would be, not the excellent principles we might write on the school room blackboard, or the ex-

hortations we voice from church pulpits, ancient shrines or via the radio, but what we do to our fellow men.

Our Education Policies Commission says (partly in a series of cartoons): "A world educated half for war and half for peace could be neither free nor peaceful." With that I agree. But permanent military armament in any nation or groups of nations is a more potent education for war than pious peace slogans are education for peace. For teaching by example is more effective than preaching in their influence on man's thoughts, emotions, and action.

Hence, I have scant hope for peace in the proposed United Nation Agency for International Education, if the United Nations maintain large armaments and develop more efficient instruments for killing our fellow men, destroying the products of human toil, and wasting man's not too abundant natural resources requisite for the better life.

In the *Readers's Digest* for December this year Thomas M. Johnson assumes as self-evident that "our influence in any international league for peace will be directly proportionate to our armed strength." To me such a *Pax Americana* is not a peace through cooperation and understanding. It is peace by force. Then Mr. Johnson outlines the armed forces needed for such a peace, armed forces (including universal conscription) greater than the peace time military forces of either

Germany, Russia, or the British Empire. Senator Robert M. LaFollette asks (*The Progressive*, Oct. 16, 1944) this pertinent question: "Why is there so little of the four freedoms and so much of the Four Horsemen of power politics—imperialism, spheres of influence, special privilege, exploitation, in every settlement proposed thus far?"

The average common man and woman in every country I know (and that goes for the British, the German, the Frenchman, the Italian, the Russian, the Chinaman, and the man of Nippon) are pretty fair and decent folks, when not stirred to fear and hate by their economic, political, educational and religious "leaders." This is understandable, as the present human race is one species. If left alone, in the usual human intercourse, the common people would not wage major wars, in perpetuity.

The realization that we are brethren under the skin would in time traverse racial and political boundaries. Particularly such intelligent subdivisions of our race as the English and German people might soon begin to ponder the historic fact that they are, by and large, first cousins, cease their perpetual family feuds, and begin to labor, love, and trade in peace. If we cannot learn to curb our greed and vanity sufficiently to invent, manufacture, and trade everywhere in the world, without recurrent war and violence, we deny the supremacy of

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brains and reason, and nullify science and understanding.

The delusion of "racial superiority" has infected other minds than Hitler's. In fact, Herr Hitler might well have borrowed it from the ancient Hebrews. For the phrase, "the chosen people," is not without that taint. It is the credo of kings and tyrants, way back. It is an inherited disease in all aristocracy of birth and wealth. There is no "natural immunity" against it in the brain of any man. But knowledge, understanding, and reason is a partial prophylaxis. These remedies, however, are largely rendered non-available by war.

In brief, every normal man and woman of every race, in every country, is equally entitled to our sympathy and aid in times of major disasters, including wars, and equally entitled to our friendship and cooperation in their groping toward the better life.

6. The City Club of Chicago, recently summarized (through its Committee on Post-War Planning) the Dumbarton Oaks Conference proposals, as follows:

"The tentative plan for world organization released by the conference at Dumbarton Oaks supports the hope that mankind may succeed in saving itself from the total destruction of future wars. It is only a beginning, but it is a sound beginning sponsored by the four largest of the United Nations and approved by the candidates

of both major parties for the presidency of the United States.

"The plan proposes the establishment of an international organization to maintain peace and security. It provides for:

a. "A General Assembly of all peace-loving nations each of which shall be entitled to one vote. This Assembly would be a world forum for the discussion of all questions relating to international peace and security. It would initiate studies and make recommendations for international cooperation in political, economic and social fields.

b. "A Security Council of eleven members with the United States, Great Britain, Russia, China and, in due course, France to be permanent members, the other six to be elected by the Assembly for two-year terms. This council would have the authority to order moral, diplomatic, economic or military sanctions to control threats against peace.

c. "An International Court of Justice to act as the judicial arm of the organization.

d. "A Military Staff Committee under control of the Security Council and composed of the chiefs of staffs of the 'Big Four' nations. Air force contingents would be made available by member nations for 'combined international enforcement action' and additional military forces would be provided under special agreements to be worked out.

e. "An Economic and Social Council composed of representatives of eighteen nations. The states to be so represented would be elected by the General Assembly for three-year terms. This council would seek solutions of economic, social and humanitarian problems and promote the respect for human rights and fundamental freedoms. It would set up Economic Commission, a Social Commission and such other commissions as may be required with permanent staffs of experts.

f. "A general Secretariat for the Assembly and Security Council headed by a Secretary-General who would act as chief administrative officer of the United Nations. He would be elected by the Assembly upon the nomination of the Security Council.

"The structure for an international organization thus laid out includes the principal features of plans proposed by many organizations that have devoted years to the study of world security. It leaves a number of debatable questions unresolved, yet it is definite enough to stand as a strong declaration of the direction in which the leaders of the United Nations are determined to proceed.

"Opinion polls indicate that a vast majority of Americans favor our joining an international organization with the power to outlaw war."

An enduring peace is much more than the absence of armed conflicts. An enduring peace is positive, not by

force, but by understanding, cooperation, and approximate justice on the part of all nations.

The appraisal of the Dumbarton Oaks plan is rendered more difficult by what it does not say rather than by what it specifically recommends. That is the only interpretation I can place on the following words of Mr. Sumner Welles, our former Undersecretary of State (Washington Post, Nov. 15, 1944): "Unless the way is speedily found to obtain for the smaller nations that measure of authority and that equality of rights within the world organization to which they are justly entitled, no world organization other than a great-power military alliance can presently be created."

7. The Morgenthau-Eisenschiml proposals. Secretary Morgenthau proposes for one of our opponents, Germany, in addition to total disarmament and military occupation, that its sixty million people be herded on small farms and confined to agriculture. This proposal is implemented by Dr. Otto Eisenschiml (*The Chemist*, XXI, Sept., 1944, pp. 371-374; *Science Illustrated*, Oct. 1944, p. 56) as follows:

"German science must be completely sterilized."

Dr. Eisenschiml will permit the defeated and disarmed Germans to pursue agriculture and medicine. But he apparently forgets that the science and art of modern medicine depend on the sciences of chemistry, physics,

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biology, and bacteriology, as well as on constant contacts with current research in these fields published in every other country in the world. It seems that Dr. Eisenschiml also has overlooked the fact that modern agriculture depends to no small degree on the sciences of chemistry, physics, engineering, botany, zoology, and bacteriology.

It seems that Dr. Eisenschiml exceeds the facts when he states that "everybody is more or less agreed that the Germans must be decapitated" in this manner to insure a durable peace. At least nothing like the Morgenthau-Eisenschiml proposals have so far been advocated by President Roosevelt, Secretary Hull, or the Dumbarton Oaks Conference, so far as the American citizens have as yet been informed. The Morgenthau-Eisenschiml program for post-war Germany is not in the *Atlantic Charter*. The Morgenthau-Eisenschiml proposals echo the voice of the Roman Senate: "Carthago delenda est." Yes, Carthage was destroyed. But Rome also is no more.

That Roman voice of war and vengeance was silenced by war and social degeneration long, long ago. Its recent reincarnation in Benito Mussolini resulted in stark misery not only for the Italian people, but also for the peoples of Greece, France, Spain, Egypt, Ethiopia and the United Nations.

From what I know of man, past and present, Dr. Eisenschiml's pro-

posal is not a step towards a more durable peace. It seems to me unworkable, unjust and unwise. For even should history prove that Germany alone was responsible for starting the present global war, no responsibility for that crime can be placed on the shoulders of the millions of German children and youths under eighteen in 1939, on the German children born during the last five years, or on those yet to be born during the next thirty years. As a nation, we should not out-Hitler Hitler's measures for war with our measures for peace.

Who supports the Morgenthau-Eisenschiml plan of "decapitation" of Germany? In their recent book: *The Control of Germany and Japan*, Harold G. Moulton and Louis Marlio advocate preventing Germany from producing aluminum ingots, synthetic petroleum, airplanes, and hydroelectric power. But these authors also point out that stopping all of Germany's heavy industries and reducing the Germans to agriculture alone would leave half of the German people without work, without food, without means of subsistence, and "this would work disastrously on other countries with which Germany normally maintains extensive import and export relations."

The American Federation of Labor, April 5, 1944, declared: 1. *War is the enemy*. The American Federation of Labor believes that war among na-

tions . . . is the supreme enemy of . . . the common people of the world.

2. *Lasting peace must rest on social justice and include all peoples.*

I have studied the "measures to promote international law and order," proposed by the United States Chamber of Commerce, March, 1944. These measures are in line with the Dumbarton Oaks recommendations, and not in line with the Morgenthau-Eisenschiml proposals. So are the more recent proposals of the Catholic Bishops of America. These are significant voices from important segments of our American citizens.

I think the Dumbarton Oaks proposals, administered by men of good will, wisdom, and integrity will work, and will work towards a more durable peace, *provided* the statesmen in the United Nations are sincere in a live-let-live policy for *all* nations. It was too little of that honesty and wisdom and too much of the primitive national greed, racial pride, and myopic vanity that rendered Woodrow Wilson's League of Nations such a tragic failure in man's long, long hunt for the road to "peace on earth and good will to man."

For example, every informed Citizen knows that Mr. Churchill has at times spoken with considerable admiration and eloquence both of Hitler and Mussolini, just as he has spoken with vehemence against Russian communism. In the winter of 1919 there were British officers in Finland trying

to induce the Finns to make war on Russia. But Finland's recent war with Russia was not looked on with approval either by the British or by us. The actual international policies of statesmen are more variable than the weather—except on one point: Take care of Number I, no matter what happens to the other fellow.

If the May Bill (post-war universal military conscription) becomes the law and the settled peace time policy of our beloved land, other nations have good cause to doubt our sincerity in the Dumbarton Oaks plan. Man learns very little from man's past mistakes. The armies of ancient Sparta neither produced peace nor the security of ancient Greece. The huge armies of Rome, Persia, Turkey, Egypt, Spain, France made neither for peace nor for salvation of these empires. The lesson from the past speaks to the contrary.

Mrs. Eleanor Stevenson, an American Red Cross worker in the U. S. Army hospitals in Africa and Italy says (*Saturday Evening Post*, Nov. 4, 1944, p. 109): "You simply couldn't look those men in the eye and say, 'Your sacrifice was worth-while. It's men like you who are ending war for all time to come and are bringing Christian brotherhood to the world.' For you can't sit in a ward like that and see the things you see, and hear the things you hear, and believe that the world is a very Christian place, or that there is any brotherhood of

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man, or that the world will have learned its lesson and this will be the last war."

My own service in the war devastated countries in Europe, Dec. 1918-Aug. 1919 on the American Relief Administration under Herbert Hoover placed me face to face with the terrible back-wash of war. Because of that experience, plus my acquaintance with history and human nature, I can understand Mrs. Stevenson's despair of war, as an instrument towards peace. Mrs. Stevenson's black prose reminds me of Mr. John McCutcheon's equally black lines of poetry of 1914:

"Gold and green are the fields in peace,
Red are the fields in war;
Black are the fields when the cannons cease,
And white forevermore."

I do not subscribe to the stark pessimism of Mrs. Stevenson and Mr. McCutcheon, and I am too much of a realist to place much confidence in the Utopia of the "Atlantic Charter." That noble document promises more than our generation can deliver, even did all men of wisdom and good will in every land join hands. This brigade is as yet too small, and already signs to "detour," in German and Japanese, seem to be in the process of preparation. That was not in the "Charter" two years ago, for Germans and Japanese are also people.

Modern wars plant the poisonous seeds of future wars, as our hates and fears, revenge and sorrows, greed and

pride obscure our sense of justice, blind us to the lessons of history, and make us deaf to the pleading voices of man's cultural leaders of the past. But these facts do not induce the paralysis of pessimism and despair. They are spurs to greater endeavors, for our responsibilities towards the human race parallels our understanding of man.

From all the evidence now available it seems clear that in the past, greed, guile, and violence had survival value for primitive man. Assuming that these drives can be curbed on a national or international scale by new mores based on understanding, reason, and emerging justice, will the latter have equal survival value in and for the kind of society we hope to build? My answer is yes. But men are still driven by greed and confused by guile, rather than guided by reason based on our expanding knowledge.

In times of peace science has greatly enlarged man's understanding, conquered many of his diseases, lengthened his life, multiplied his joys, decreased his fears, and added much to his physical comforts and powers. But man may and does use these and other achievements for a greater social injury, instead of for a further social advance.

Science is specifically human, in that it stems from the innate curiosity of all men and the conspicuously plastic brains of the ablest, if not the noblest, of our fellows. Any leader who

shackles such brains in any land is man's enemy number one. The scientific method and its products cannot be, in any fundamental and permanent sense, in conflict with human nature, though our present human society, a product of the past, dominated by greed, force and fear, may be and is in conflict with the scientific method.

Whether science and the scientific method, whether understanding, honesty, reason and justice can contrive survival values equal, if not superior to the blind forces of nature which shaped man's past, is as yet in the laps of the gods. Still, we cannot deny the possibility, and we will nurse the hope that the hairy ape who somehow lost his tail, grew a brain worth having, built speech and song out of a hiss and a roar, and stepped out of the cave to explore and master the universe, may some day conquer his own irrational and myopic behavior towards his kin.

Even in the face of current hate, fear, and pessimism, during the ups and downs of a million years, man has gradually acquired more understanding, more freedom from fear, more dignity, greater kindness and a clearer conception of justice. Even though for the moment, "the bird of sorrow" is not only flying over our heads, but is actually nesting in our hair—to borrow a Chinese proverb—that bird will not nest in our hair forever, even should a blackout on the

light of science be decreed in every land.

For, slowly but surely, the method of science will help to make life more intelligent, toil more cheerful, fear and hatred, pain and tears less prevalent in our lives. If in any place or time the blind fury of hatred of our brethren and the insane violence of war render the pursuit of science impossible, and the scientific method submerged and forgotten, it will be rediscovered, in better days, for better uses, by better men.



The Naval Stores Department of Hercules Powder Company announces that a new sales department has been established in Canada to comprise the entire Dominion of Canada and Newfoundland. Harrisons and Crosfield (Canada) Ltd., Montreal, with branch offices in Toronto, Winnipeg, Vancouver, Calgary, and Edmonton, will continue to be the department's authorized dealer in the Canadian District.



The British Government is considering the appointment of scientific attaches to all foreign countries. Scientific and technological contacts between the United States and Great Britain are being handled at present by a British scientific mission already in Washington, and an office for a similar purpose has been set up in Chungking by the British Council.

A Method to Control Germany

Arthur Schroder, F.A.I.C.

(Impromptu discussion following the paper on "What Shall We Do with Germany")

DURING the past two and one-half years, about 45,000 foreign owned patents have been vested (seized) by the Alien Property Custodian. Roughly two-thirds of them are of German origin. A review of these shows that military necessities like carbide tools, optical instruments, high-strength rayon fibers, synthetic wool, alloys, steel strip, phenols for explosives and plastics, etc., were well-protected by such patents, but since vesting, are now being daily supplied to our own industries and armed forces for prosecuting the war.

To destroy all of Germany's scientific laboratories would remove the possibility of our ever again profiting by similar patents. I, therefore, advocate not destruction, but a very rigorous control.

It may be protested that such control is impracticable, that it will require too many technically trained men to act as policemen, especially when we need every one of them with their technical know-how, in our own post-war economy. It may be added that chemists and chemical engineers make poor policemen, and also that

all research can be used for military purposes.

It would no doubt require many of our best technologists thus to control all the research laboratories and facilities of Germany. But there is another way to accomplish this control without requiring a great number of our scientists. Simply control only those industries whose products in turn control all the other industries, i.e., the chemical laboratory supply houses and the few instrument manufacturing industries.

The foot on the accelerator controls the car; the hand on the throttle controls the motion of a train of freight cars carrying 100-octane gasoline to the front, and to put this into our own every-day chemical terms of burettes, balances, and reagent chemicals, the laboratory apparatus controls our industries.

He who controls the laboratory apparatus industry, controls the quality of our steel, our munitions, in fact all our supplies. So, also, he who controls the production of our indicating and control instruments, controls the quantity as well as the quality of the

output of our heat-treated steels and alloys, our rolling mills, our butadiene fractionators for gasoline or for rubber, our phenol stills for picric acid, or for plastics, etc.

Just consider what would happen to us if six or eight of our main laboratory supply houses were suddenly blown up. What would happen if our control instrument factories were suddenly shut down? How long would our production giant continue to function? How many guns, jeeps, planes or tanks could we turn out? How many gallons of high-octane gasoline, or how many more B-29's could we still produce? In short these two industries are the bottle-necks of

the entire service of supplies.

Is not such an industry worth controlling? Can it not in turn control all foreign research and production? There are few laboratory supply houses and instrument manufacturers in all of Germany. There would be few men required to supervise and control them properly. Can we control them and thus control what we must, if we are to prevent another war?

If we still want to have research in Germany, let us at least control where the control does control, since the laboratory supply houses and the instrument manufacturers are the key to military production.



Otto Eisenschiml, F.A.I.C., spoke January 13th, in Duluth, Minnesota, at the Duluth Luncheon Club, on "What To Do With Germany After the War," and in the evening, before the American Chemical Society on "This Profession of Ours." On January 15th he spoke before the State Teachers' College on "The Drama of Lincoln's Assassination," and later in the day before the Duluth Engineers' Club on "The Technologists in This War." His schedule also included a talk before the American Chemical Society in Memphis, Tennessee, January 19th, on "This Profession of Ours."

Leonard Wickenden, F.A.I.C., wrote a two-part article on "Sugar: Is It a Food or Poison?" which appeared in the November and December issues of *The Manufacturing Confectioner*.



Officers of the Textile Research Institute, Inc., reelected at the recent Annual Meeting are: Fessenden S. Blanchard, president and executive secretary; Douglas G. Woolf, first vice-president; Robert E. Rose, vice-president; Harold DeWitt Smith, vice-president; Edward T. Pickard, treasurer.



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THE Baltimore Chapter met at Loyola College, November sixteenth. Dr. F. O. Rice, head of the Department of Chemistry, Catholic University of America, Washington, D. C., was the speaker and discussed "Aliphatic Free Radicals." Dr. Elsa Orent-Keiles, nutrition chemist, Division of Foods and Nutrition, Agricultural Research Administration, gave the INSTITUTE a new goal to shoot at by recently obtaining ten new members.

A summary of Dr. Rice's talk follows.

In the early part of the nineteenth century, organic chemists had no preconceived notions as to the valences of carbon in organic compounds. They were acquainted with two oxides of carbon and it seemed only natural that hydrides of carbon should also exist having carbon in different valence states.

Early experiments in which lower alkyl halides were heated with metals yielded gases which were thought for a long time to be free methyl or ethyl

radicals. Even when these gases were shown to be dimers of the radicals, it was thought that the radicals formed a sort of loose association, and that dimethyl and diethyl were different from ethane and butane. To Scherlemmer belongs the credit for proving that the radical dimers and the compounds claimed to be only isomers were completely identical.

It took, therefore, almost fifty years to prove that free aliphatic radicals could not be prepared by the ordinary methods of organic chemistry, and this work led to the almost universal adoption by 1850 of Kekule's postulate of the tetra-valency of carbon.

During the succeeding fifty years, there was hardly a single serious attempt to question this postulate; when we consider the tremendous development of organic chemistry that occurred during this period with the resulting preparation and study of many thousands of organic compounds, it becomes clear that the tetra-valency of carbon had become almost

CHAPTERS

a matter of dogma in organic chemistry. And it is this tradition, built up over a long period of years, which accounts for the attitude of profound skepticism on the part of organic and physical chemists towards claims that free radicals can be prepared, and that they are, further, important intermediates in many organic reactions—particularly in thermal decompositions.

Paneth and Hofeditz in 1929 prepared the free methyl radical by heating tetramethyl lead in a current of hydrogen at low pressures. They showed that methyl radicals prepared in this way would combine with mirrors of various metals forming the corresponding volatile organ-metallic compounds. They showed that the half-life of the radicals was very short, amounting to only a few thousandths of a second. This measurement was exceedingly important because it showed that the methods of classical organic chemistry were powerless to study or even to isolate free aliphatic radicals.

Later work by Paneth and other co-workers showed that the ethyl rad-

ical could be prepared in the same way. Apparently larger radicals were unstable and fall apart into olefines and smaller radicals.

The next major advance in free radical chemistry was made in this country when it was discovered that ordinary organic compounds, such as hydrocarbons, ethers, ketones, etc., when decomposed according to the Paneth technique, also yield free radicals.

Free radicals probably play an important part in many organic reactions, especially those thermal decompositions occurring at high temperatures. The theory is that the organic compound suffers a primary break into two free radicals which initiate a recurring cycle of reactions that produce the product. It is supposed that a very few radicals can initiate a large number of cycles and thus cause extensive decomposition. This theory has a very practical aspect in that, if it is true, it should be possible to have a new kind of homogeneous catalysis in which free radical-producing substances initiate chemical reaction.

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THE chapter met December 8th in Huyler's Restaurant, 310 South Michigan Avenue, Chicago, Illinois. A symposium on "What Shall We Do With Germany?" was held with the following speakers: Dr. Otto Eisenschiml, who favored the prohibition of scientific laboratories in Germany; Mr. E. Gordon Fox, who presented the conservative point of view, and Dr. Anton J. Carlson who talked on the essentials of a lasting peace as viewed by a biologist.

Dr. Eisenschiml's paper was published in the September issue of THE CHEMIST. The papers given by Mr. Fox and Dr. Carlson appear elsewhere in this issue. The discussion following the main talks lasted over an hour and brought out other interesting facts, including the state-

ment that there is a fourth point of view—the Communistic. The Communists have been doing educational work among German prisoners of war so they will go back to Germany as friends of Russia and friends of Communism. The United States should do such educational work for democracy. It was also questioned whether propaganda is not more important than science. Inasmuch as the world is moved by emotion rather than by logic, we find that propaganda determines how science is used. This is a subject which scientists should consider more seriously.

Arthur Schroder's recommendation for control of military production in Germany follows the papers by Mr. Fox and Dr. Carlson in this issue of THE CHEMIST.

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THE November meeting of the Los Angeles Chapter was held on the 27th at the Clark Hotel in downtown Los Angeles, with Albert Salathe, chairman presiding. More than sixty persons were present. The guest speaker of the evening was Dr.

Gustav Egloff, president of THE AMERICAN INSTITUTE OF CHEMISTS.

After recognition of certain foreign chemists in the audience, Dr. Egloff called attention to the fact that lasting peace had not been achieved at the Versailles Conference

CHAPTERS

where the peacemakers did not include men of scientific background. He suggested that chemists and other scientists be allowed to take part in future peace negotiations.

In discussing the Kilgore Bill, the speaker said it called for the establishment of an organization to control research and technology in the U.S.A. This control would be vested in labor unions, government officials and possibly persons not conversant with scientific matters; that anyone having six months training in a laboratory would come under the scope of the bill. The director of this organization would have the power to take over present laboratories and personnel and disband them if he saw fit. Five hundred and fifty million dollars are now being spent in research by eighty overlapping and conflicting agencies as against only five hundred million by all independent sources per year.

In the revised Kilgore Bill, this organization, known as the National Science Foundation, would make public property any patent after Dec. 7, 1941 on which any government money had been spent. He felt that patents turned over to the government are for the most part held inactive and hence do not contribute to the common good. He pointed out that the present trend was not to allow a patent to a concern, but only to individuals, as no concern could have a "flash of genius." He cited other

countries as holding scientists in much higher esteem than the U.S.A. Corrections of these faults might be secured through recommendations to the President's Planning Board. If correction is not secured, scientific research might "go underground."

Dr. Egloff felt that unionization of the chemist was not desirable, as it would kill incentive. He felt regional representatives would be most helpful in forwarding the aims of the Institute and suggested that the following attack on the overall problem was in order:

1. That the chemist through magical powers could do work in short order, without expense of energy as is the case in other professions.
2. That the chemist improve himself in outside activities.
3. That a definition of chemist be found so that through nation-wide federal channels, helpful legislation could be drawn up to improve the chemists' status.

Considerable interesting discussion followed in which past chairman R. J. Abernethy asked what each one could do as a member to assist in the program. Dr. Egloff replied:

1. To disseminate educational material provided by the Institute.
2. To get more members.
3. To obtain more advertising for the 'CHEMIST'.
4. To advance the idea of regional representatives.
5. To keep in touch with the press.

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THE Chapter met at the Hotel Carter, Cleveland, on December twenty-seventh for the purpose of electing officers. In addition to those listed above, the following local council members were elected: Miss Elizabeth Pomerene, of St. Lukes Hospital; Matthew M. Braidech, Case School of Applied Science; Hayden

B. Kline, Industrial Rayon Corporation; Gordon H. Mutersbaugh, the Glidden Company; and Monroe J. Bahnsen, Ferro-Enamel Company. By-laws are being prepared and will be adopted at the next meeting of the Chapter, for which the date has not yet been determined.

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For Your Library

TECHNOLOGISTS' STAKE IN THE WAGNER ACT. Edited by M. E. McIver, H. A. Wagner, and M. P. McGirr. *American Association of Engineers*, 8 South Michigan Avenue, Chicago, Ill. 1944. 272 pp. 6" x 9". \$2.00.

This volume contains findings by the American Association of Engineers on the Wagner Act as it affects engineers, chemists, and architects, and is dedicated to "unity in the engineering profession."

The Wagner National Labor Relations Act specifies that "representatives designated or selected for the purposes of collective bargaining by the majority of the employees in a unit appropriate for such purposes, shall be the exclusive representatives of all the employees in such unit for the purposes of collective bargaining in respect to rates of pay, wages, hours of employment, or other conditions of employment."

It grants the employee the right to self-organization without any interference by the employer, and the right to appoint a representative with whom the employer must deal. It defines the employer as any person acting in the interest of an employer, directly or indirectly.

We thus have three points of ambiguity to contend with; who is an

employer, what is an appropriate bargaining unit, and how is the representative designated. These are thoroughly discussed in this book.

If we compare the business structure with army organization, we find a certain similarity. In the army a general staff decides the policies. In business, ownership decides the policies. In the army, officers are hired to direct the tactics of war. In business a directional group called management carries out the policies of the ownership. The army officers in turn have soldiers who carry out the work of the army, while the management has workers who put the material through the equipment. Material and equipment of the army are the property of the state, and that of the business structure is the property of ownership.

The directional group of the corporation has the function of both employers and employees. By the given definition of employer in the Wagner Act, they cannot act as employees, which actually they are. The position of this directional and control group is thus anomalous.

This management or directional group is professional or semi-professional, consisting of engineers, chemists, physicists, accountants, architects, draftsmen, industrial managers, sales

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managers, purchasing agents, etc., who might be considered sublimated craftsmen and therefore classifiable into craft unions, were it not for that element which makes them duty and honor bound.

The National Labor Relations Board has had the task of classifying the various employees and has made a cleavage in the management based upon individual relationship between employee and owner or employer. Any taint of consideration for the owner classifies an individual as an employer. Unless he is vociferously skillful, he will be dominated by common labor unions.

These various questions raised by the enactment of the Wagner Act are well-treated in this book. The material is carefully written and soberly calls attention to the fact that any consideration for the technical professions was contemptuously ignored by the framers of the act.

For the professional man then, to avoid domination by commoners, it is necessary to either work out a "modus vivendi" with the employing group or to form a series of independent labor unions, each an appropriate bargaining unit, or both.

Each profession has a common bond in training and occupation and is organized to some degree on a national basis. These national societies will have members in industrial plants. Organization on national and local lines is indicated with national or-

ganizations supporting their individuals at strategic points.

To any one at all involved in this upsurge of collective bargaining, by all means buy this book. It is full of meat and meditation.

—J. A. STEFFENS, F.A.I.C.

Kirk and Othmer to Edit Technical Encyclopedia

Professors Raymond E. Kirk, F.A.I.C., dean of the Graduate School and head of the Department of Chemistry, and Donald F. Othmer, F.A.I.C., head of the Department of Chemical Engineering, Polytechnic Institute of Brooklyn, will edit the "Encyclopedia of Chemical Technology" to be published by Interscience Encyclopedia, Inc., and distributed by Interscience Publishers, Inc., New York.

Ten volumes will be published, the first scheduled to appear in April, 1946, and the last in April, 1949. Miss Janet D. Scott, formerly with "Chemical Abstracts" and the Calco Chemical Division of American Cyanamid Company, will act as assistant editor. An editorial board is being selected.



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Meeting Dates

Jan. 18. Baltimore Chapter, THE AMERICAN INSTITUTE OF CHEMISTS. Speaker: M. X. Sullivan, Chemo-Medical Research Institute, Georgetown University, Washington, D. C. Subject: "Precision in the field of Biochemistry."

Jan. 26. New York Chapter of THE AMERICAN INSTITUTE OF CHEMISTS 26th Floor. No. 2 Park Avenue, New York, N. Y. Speakers: C. L. Gabriel, Vice President, Publicker Commercial Alcohol Company "Recent Developments in Fermentation Chemistry"; Dr. Evan C. Williams, Director of Research, General Aniline and Film Corporation, "The Chemist in Management."

Jan. 30. Pennsylvania Chapter. THE AMERICAN INSTITUTE OF CHEMISTS. Engineers' Club, Philadelphia.

MEETING DATES

Speaker: Dr. M. L. Crossley. Research Director, American Cyanamid Company, "Professional Status and Licensure."

Feb. 15. Baltimore Chapter, THE AMERICAN INSTITUTE OF CHEMISTS. Speaker: Harry Darroch, Industrial Corporation of Baltimore. Subject: "Importance of Human Relations in the Coming Era."

Feb. 27. Pennsylvania Chapter. THE AMERICAN INSTITUTE OF CHEMISTS. Engineers' Club, Philadelphia. Speaker: Dr. Gustav Egloff. President, A.I.C., "The Chemists' Role in a World at War."

Mar. 15. Meeting. Baltimore Chapter. THE AMERICAN INSTITUTE OF CHEMISTS.

Mar. 23. New York Chapter of THE AMERICAN INSTITUTE OF CHEMISTS 26th Floor. No. 2 Park Avenue, New York, N. Y. Speakers: Dr. Elmore H. Northey, Pharmaceutical Division, Calco Chemical Company, "The Therapeutic Implications of the Sulfa Drugs"; Dr. Walter Modell, Cornell University Medical College, "Recent Developments in Antibiotics."

Mar. 27. Pennsylvania Chapter. THE AMERICAN INSTITUTE OF CHEMISTS. Engineers' Club, Philadelphia. Speaker: Dr. Foster D. Snell, President, Foster D. Snell, Inc. "The Factors in Detergency."

Annual Meeting 1945

The Annual Meeting of THE AMERICAN INSTITUTE OF CHEMISTS for 1945 will be held May 11th and 12th in Columbus, Ohio, with headquarters at the Deshler-Wallick Hotel in Columbus, Ohio.

The Miami Valley Chapter will be host for this meeting. Dr. James R. Withrow is honorary chairman of the Committee on arrangements.

Apr. 18. Joint Meeting. Pennsylvania Chapter. THE AMERICAN INSTITUTE OF CHEMISTS, and Philadelphia Section, The American Chemical Society, Engineers' Club, Philadelphia. Speakers: Dr. H. G. Byers, F.A.I.C., "Soil Genesis and Some Soil Properties."

Apr. 19. Meeting. Baltimore Chapter. THE AMERICAN INSTITUTE OF CHEMISTS.

Apr. 27. New York Chapter of THE AMERICAN INSTITUTE OF CHEMISTS. Student Medal Presentation, 26th Floor, No. 2 Park Avenue, New York, N. Y. Speaker: Professor Alexander O. Gettler, Toxicologist of the City of New York, "Contributions Chemistry has Made in the Detection of Crime."



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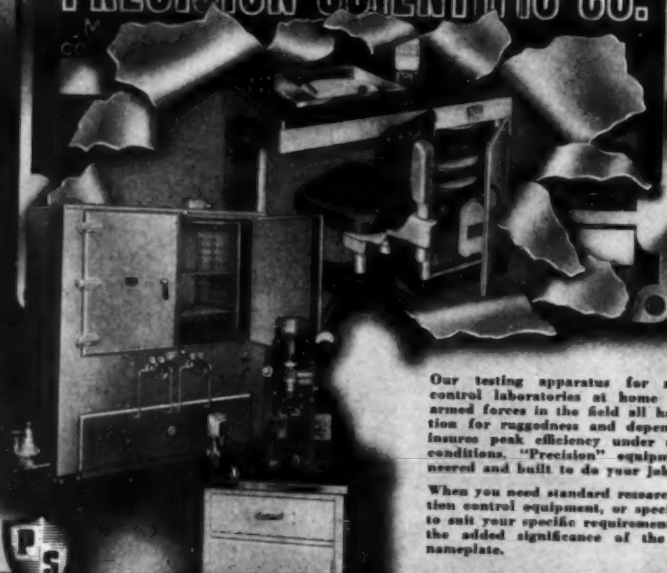
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For your cooling problems we can offer many years specialized experience, and a successful record of over twenty-five years designing and building ejectors for other industrial vacuum requirements.

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The result of its tremendous amount of research work in helping Wrinkle users to secure best results in formula and application is indicated in the rapid expansion of its laboratory facilities.



1938 The first Wrinkle Laboratory devoted to the interest of Wrinkle users and 600 sq. ft. of floor space.

1942 Progress made it necessary to move the Wrinkle Laboratory to larger quarters. Here we had 1000 sq. ft. of floor space.



Billy Wrinkle Says

"The best way to test the research and inventive skill of Wrinkle is to send us your product finishing problem."

1944 Constantly increasing demands on our research facilities resulted in this new Laboratory—the most modern and best equipped of its kind—with some 4000 sq. ft. of floor space and modern facilities available for research and development on all phases of formulation and application of Wrinkle coatings.

NEW WRINKLE INC.

1773 Springfield St., Dayton 3, Ohio

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